

ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Headquarters

Planning Area(s): Atlantic

Title: Pilot Study of Aerial High-Definition Surveys for Seabirds, Marine Mammals, and Sea Turtles on the Atlantic OCS (M10PC00099)

BOEM Cost: \$896,310

Period of Performance: FY 2010-2012

Conducting Organization(s): Normandeau

BOEM Contact: [Dr. James Woehr](#)

Description:

Background: BOEM has identified impacts to birds from alternative energy development as a primary concern and seeks additional data to describe bird use of the OCS. With the publication of the BOEM Framework for Renewable Energy Development on the U.S. Outer Continental Shelf, significant demand for leases for wind energy development on the OCS has developed, creating a critical need for information on seasonal distributions and abundances of birds on the OCS. Monitoring birds offshore has been limited worldwide due to high cost and difficulty of access. Traditional boat transect surveys and observers on “ships of opportunity” have proved to be too slow and too limited in scope to provide the needed information. Traditional aerial surveys have unknown and potentially large errors of estimation and must be flown at a low altitude that disturbs the birds on the ocean surface below the aircraft, resulting in avoidance behaviors that cause an unknown proportion of the birds to be missed.

High definition cameras mounted on aircraft have seen limited use in Europe, and the technique shows great promise as a means to conduct aerial surveys of birds offshore with minimal error and without disturbance to birds below the aircraft. Such high definition aerial surveys have the potential to provide good surveys simultaneously for marine mammals and sea turtles as well as for birds. This technique will provide information over a broad area of the OCS during daylight and good visibility conditions. Round-the-clock, all season information will be possible when this technique is used in combination with others, such as automated acoustic surveys, which function both day and night and during both good and poor visibility conditions, but gather information only for specific point locations rather than across broad geographic areas. Once effective and efficient methods are established for both acoustic surveys and for aerial surveys using high definition imagery, it will be possible for the first time to document seasonal and annual variability in presence and abundance of birds, marine mammals and sea turtles across wide regions on the OCS.

Objectives: The objectives of the study are to:

- 1) Use high definition cameras mounted on aircraft to assess the feasibility of the technique for surveying birds, marine mammals, and sea turtles from shore to 30 miles offshore between Maine and Florida.
- 2) Determine a combination of aircraft type, camera, mounting, and onboard recording system that would result in effective and economical monitoring.
- 3) Document procedures for controlling focus and calibrating transect width in the video frame to maintain desired transect width at a given flight altitude.
- 4) Determine a recommended flight altitude to yield imagery sufficiently sharp to detect and to identify to species the birds, marine mammals and sea turtles within recorded transects without disturbing the animals beneath the aircraft.
- 5) Compare the effectiveness and economic efficiency of a single camera system vs. a multiple-camera system.
- 6) Determine a transect sampling scheme that would suffice in all four seasons of the year for effective monitoring of sea birds, marine mammals and sea turtles while yielding acceptable confidence intervals on estimates.
- 7) Document the cost/km² to fly the recommended survey scheme(s).
- 8) Determine the cost/km² to analyze the recorded data manually.
- 9) Evaluate the need for development of software to automate the analysis of video data and estimate the cost to develop such software.

Importance to BOEM: With the publication of the BOEM Framework for Renewable Energy Development on the U.S. Outer Continental Shelf, significant interest in leases for wind energy development on the OCS has developed. Further, there is renewed interest in conducting geological and geophysical (G&G) activities along the U.S. Atlantic OCS and continued interest in G&G activities in the Gulf of Mexico and Alaska. Information on seasonal and annual variability in bird, marine mammal and sea turtle use of the OCS is now critically needed for environmental analyses of proposed sites. This pilot study would test new technology that could provide information on seasonal and annual variation in distributions and abundances of bird, marine mammal and sea turtle species on the OCS of the Mid-Atlantic Region. If found viable, this technology could also be useful in determining the species for the protected species observer program, required as monitoring and mitigation measures by the National Environmental Policy Act, Endangered Species Act, and Marine Mammal Protection Act.

Current Status: September 22, 2010. The project continues. Aircraft and camera/technical specifications have been determined. Digital images obtained in May 2012 off Oak Island, NC are now being analyzed.

Final Report Due: September 23, 2012

Publications: None.

Affiliated Web Sites: None.

Revised Date: March 13, 2012

ESPIS: Environmental Studies Program Information System

All *completed* ESP studies can be found here:

http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp